86% Carbon Emission Reduction with a Reusable Sharps Container

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Background: UK hospitals are seeking greater sustainability. Waste reduction studies using reusable sharps containers are well established, but lack the depth of a Life Cycle Assessment (LCA) of energy emissions for manufacture, transport or processing.

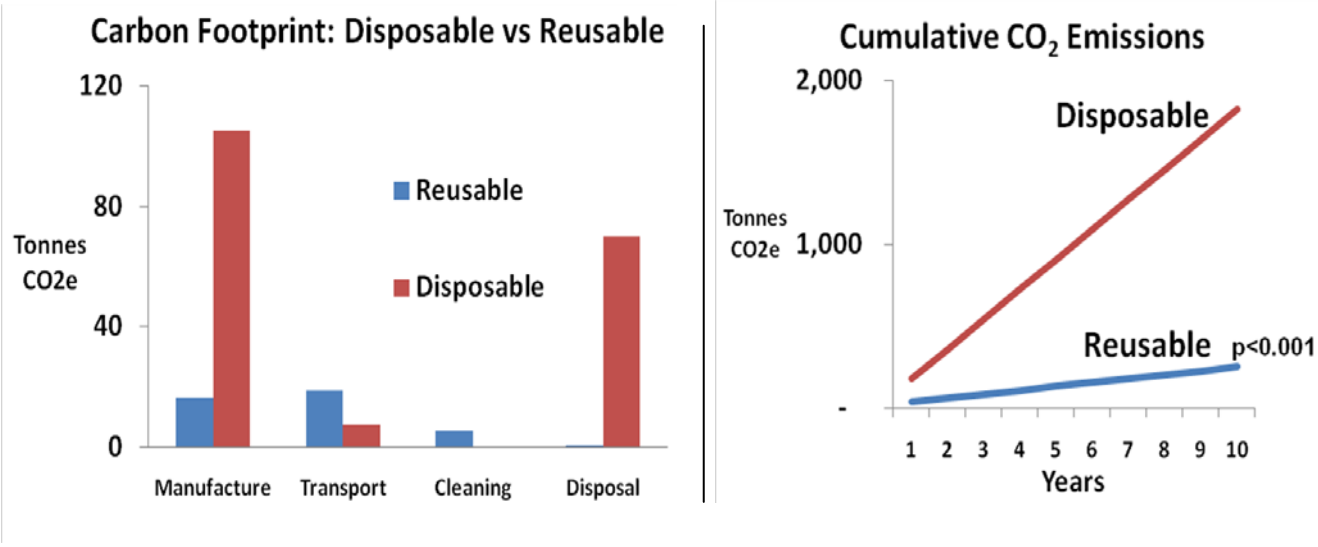
Objectives: To develop an innovative model to ascertain the difference in carbon emissions between reusable and disposable sharps containment systems.

Design and Methods. We used a Before/After intervention model from a 1,250 bed UK acute-care Trust which converted from polypropylene disposable sharps containers (Daniels Healthcare, Hertfordshire UK) to an ABS reusable sharps container (Sharpsmart Ltd, Spennymoor UK). CO_2e emissions for all life stages were calculated using internationally accepted unit energy consumptions for:

- plastic pellet manufacture and container manufacture
- transport to and from hospitals;
- decanting/washing of reusables; attrition replacement of reusables
- incineration of waste; transport of residues to landfill

Average annual CO_2e was calculated over 10 yrs.
Data were analysed using CHI2 and significance set at $p \leq 0.05$.

Results: Disposables = 182.4 tonnes CO_2e/yr; reusables = 25.6 tonnes (-86%; $p<0.001$). Over 10 yrs, 466,190 disposable containers were manufactured vs 1,659 reusables.



Discussion: Manufacturing accounted for the largest CO_2e reduction, with treatment/disposal next. Transport and processing accounted for a small portion of the LCA Reusables saved 157 tons of CO_2e emissions/yr (15.1 tons/100 beds/yr).

Conclusions: Reusable sharps containers provide permanent resource efficiency and waste reduction and achieve sustainable consumption and production.